Glenn Research Center, Occupational Health Programs Manual

Chapter 2 - ASBESTOS

NOTE: The current version of this Chapter is maintained and approved by the Safety, Health, and Environment Division (SHED). The last revision date for this chapter was March 2007. If you are referencing paper copies, please verify that it is the most current version before use. The current version is maintained on the Glenn Research Center (GRC) intranet at http://smad-ext.grc.nasa.gov/emo/pub/ohpm/ohpm-manual.pdf. Approved by: Occupational Health Branch Chief Gayle Reid.

PURPOSE

This chapter establishes minimum requirements for handling, maintenance, use, removal and disposal of all friable and non-friable Asbestos Containing Materials (ACM), ACM debris, and Presumed Asbestos Containing Material (PACM) at NASA Glenn Research Center at Lewis Field and Plum Brook Station.

APPLICABILITY

This chapter applies to all personnel at NASA Glenn Research Center at Lewis Field and Plum Brook Station, including, but not limited to, civil servants, contractors, tenants, and students.

DEFINITIONS

Asbestos abatement - any activity involving the removal, renovation, enclosure, repair, or encapsulation of asbestos containing material.

Asbestos - the asbestiform (fiberous) varieties of chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

Asbestos Containing Material (ACM) and Asbestos Containing Building Material (ACBM) - any material containing more than 1% asbestos.

Asbestos Hazard Abatement Specialist – Ohio certified person with responsibility for the oversight or supervision of asbestos hazard abatement activities including asbestos project supervisors and foremen.

Asbestos Hazard Abatement Worker – Ohio certified person responsible in a non-supervisory capacity for the performance of an asbestos abatement activity.

Asbestos Hazard Evaluation Specialist – Ohio certified person responsible for the identification, detection, and assessment of asbestos-containing materials, the determination of appropriate response actions, or the preparation of asbestos management plans for the purpose of protecting the public health from the hazards associated with exposure to asbestos.

Class I asbestos work - activities involving the removal of TSI and surfacing ACM and PACM.

Class II asbestos work - activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

Class III asbestos work - repair and maintenance operations, where "ACM", including TSI and surfacing ACM and PACM, is likely to be disturbed.

Class IV asbestos work- maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.

Competent person - in addition to the definition in 29 CFR 1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them. In addition, for Class I and Class II work, they must be specially trained in a manner that meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor, or its equivalent and, for Class III and Class IV work, someone who is trained on the EPA requirements for local education agency maintenance and custodial staff according to 40 CFR 763.92 (a)(2).

Demolition - the wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

Excursion Limit - level of airborne fibers specified by OSHA that is currently 1.0 fibers per cubic centimeter (f/cc) of air, 30-minute time weighted average (TWA).

Fiber - form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.

Friable asbestos material - any material containing more than one percent asbestos that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

High Efficiency Particulate Air (HEPA) filter - a filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

Homogeneous area - an area of surfacing material or thermal system insulation that is uniform in color and texture.

Intact - the ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

Non-Friable asbestos material - any material containing more than one percent asbestos that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

> Category I non-friable asbestos-containing material (ACM) means asbestos-containing packing, gaskets, resilient floor covering, and asphalt roofing products containing more than one percent asbestos.
> Category II non-friable ACM means any material, excluding Category I non-friable ACM, containing more than one percent asbestos.

Personal Exposure Limit (PEL) for asbestos - level of airborne fibers specified by OSHA as an occupational exposure standard. It is currently 0.1 fibers per cubic centimeter (f/cc) of air, 8-hour time weighted average (TWA).

Presumed Asbestos Containing Material (PACM) and Assumed Asbestos Containing Material (AACM) - thermal system insulation, surfacing material, and other materials found in buildings which has not been properly sampled and are assumed to be asbestos containing.

Project Designer - a person who has successfully completed the training requirements for an abatement project designer established by 40 U.S.C. Sec. 763.90(g).

Regulated Asbestos Containing Material (RACM) –

> Friable asbestos material,
> (b) Category I non-friable ACM that has become friable,
> (c) Category I non-friable ACM that will or has been subjected to sanding, grinding, cutting, or abrading, or,
> (d) Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

Regulated Area - an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit. (See paragraph (e) of this section for requirements.)

Removal - all operations where ACM and/or PACM is taken out or stripped from structures or substrates, which includes demolition, renovation, maintenance, and repair operations.

Renovation - altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component. Operations in which load-supporting structural members are wrecked or taken out for demolition.

Repair - overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

Surfacing - ACM which is sprayed, troweled-on, or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).

Thermal System Insulation (TSI) - ACM which is applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.

BACKGROUND

Asbestos is a generic term applied to a number of naturally occurring fiberous mineral silicates that, when crushed or processed, break down into smaller fibers that readily become airborne. The most common types of asbestos are chrysotile, amosite, and crocidolite.

Asbestos may be found in valve stem packing, gaskets, boiler insulation, pipelagging, brake linings, shielding materials, insulating boards, roofing products, and protective clothing. In the building industry it is used in the manufacture of asbestos cement products, heat insulating, and fireproofing materials, patching and taping compounds, roofing products, floor tiles, and ceiling panels/tiles.

Asbestos is not believed to pose a health hazard unless it gets into the air and is inhaled or swallowed. Breathing asbestos fibers increases the risks of developing lung cancer (especially in active smokers), mesothelioma (a cancer of the lung lining), and asbestosis (chronic lung disease). Gastrointestinal cancers have been reported more frequently in asbestos workers, but a direct relationship between ingestion of asbestos and the development of these cancers has not been established.

Asbestos related activities are strictly regulated. Worker protection is regulated by the Occupational Safety and Health Administration (OSHA) asbestos standards, 29 CFR 1910.1001 and 1926.1101. These standards include requirements for regulated areas, employee exposure monitoring, personal protective equipment (including full body coveralls and respirators), work practices and engineering controls, competent persons, employee training, hygiene facilities, housekeeping, and medical monitoring.

Asbestos in the ambient air is covered by the U.S. Environmental Protection Agency's National Emission Standards for Asbestos, 40 CFR 61.140 - 61-157 and enforced by the U.S. EPA and the Cleveland Division of Air Pollution Control (CDAPC),

POLICY

It is the policy of Glenn Research Center to comply with all applicable regulations regarding asbestos management and to prevent illness to employees and damage to the environment from the use, removal, and disposal of asbestos.

The policy of Glenn Research Center with regard to asbestos is to

- Restrict contact with ACM to only those staff that have been properly trained and properly licensed.
- Provide sufficient training and communications so that this policy is effectively implemented.
- Ensure that contact with ACM, whether in restricted or non-restricted areas, is conducted in accordance with GRC specifications and the OSHA requirements for such work.

- Ensure that any job that may involve disturbing ACM is coordinated with the Occupational Health Branch (OHB).
- Prohibit the new use of ACM except in applications where there is no suitable non-asbestos material.
- Ensure that existing ACM materials are maintained in good condition, isolated from routine contact by the establishment of regulated areas, or abated.
- Ensure that the personnel engaged in asbestos activities are properly trained, equipped, medically monitored, and are not continuously exposed to asbestos fibers in excess of ½ of the OSHA personal exposure limits, (0.05 fibers per cubic centimeter (f/cc) of air), without personal protective equipment.
- Ensure that the levels of asbestos do not exceed 0.01 fibers per cubic centimeter (f/cc) outside of regulated areas

At GRC there are five categories of asbestos activities each with special procedures required as follows:

1. Asbestos abatement, (See Asbestos Abatement and Maintenance Procedures – add link here)
2. Maintenance activities involving asbestos, (See Asbestos Abatement and Maintenance Procedures – add link here)
3. Spill response and cleanup of ACM (See Asbestos Spill Procedures – add link here),
4. Housekeeping around asbestos materials (See Asbestos Housekeeping Procedures – add link here), and
5. Motor vehicle brake and clutch maintenance and repair activities (See Asbestos Brake and Clutch Repair Procedures – add link here).

RESPONSIBILITIES

It is the responsibility of all civil servants, tenants, and support service contractors to ensure that ACM is removed or handled only by properly trained and licensed personnel. Specific responsibilities are listed below.

Occupational Health Branch – Industrial Hygiene

- Manages Asbestos Program and worker exposure issues.
- Assures through program design and implementation that the health of non-asbestos workers, and the environment, is protected from the ACM present at the GRC.
- Maintains the facility asbestos site survey (FASS) database and files.
- Tracks ongoing asbestos abatement activities, oversees compliance with regulatory requirements, and updates the asbestos survey database.
- Maintains air monitoring and air sampling exposure data.
- Provides guidance on regulatory occupational health requirements.
- Audits COTR and contractor performance in asbestos abatement projects.
- Reviews control measures in operations involving ACM.

Occupational Health Branch – Technical Services

- Provides sampling and analysis support to identify asbestos-containing materials.
- Maintains FASS database.
- Calibrates air monitoring equipment.

Occupational Health Branch – Medical Services

- Manages and administers medical evaluation for civil servant employees identified by OHB personnel as requiring medical surveillance.

Environmental Management Branch (EMB)

- Provides guidance on the requirements of Federal, State, and local environmental regulations.
- Obtains and manages center wide blanket notifications.
- Maintains a tracking system of asbestos abatement projects.
- Provides guidance and oversight on the disposal of ACM and any air, water, or soil pollution issues.
- Upon request, arranges for the temporary storage and proper disposal of asbestos-containing wastes.

- Reviews and approves purchase requests of ACM in cases where no suitable substitute can be found.

Motor Pool Supervision (when applicable)

- Monitors the brake and clutch maintenance/repair activities, as specified in Asbestos Abatement and Maintenance Program beginning on Page 6 (need link to it)
- Automotive parts are ordered on an as needed basis from venders, specifying non-ACM.

Plum Brook Management Office (PBMO)

- Ensures that Plum Brook operations comply with this chapter and develops and implements an Asbestos Maintenance Program for Plum Brook Station Operations.

Project managers, facility management engineers, and facility operations personnel

- Ensure that ACM which may be disturbed in any renovation and maintenance activities is identified in the scope of work and removed only by qualified asbestos abatement or maintenance workers.
- Ensure that survey protocols are conducted in accordance with all requirements.

Contracting Officer's Technical Representative (COTR)

- Notify EMB, in advance, of the date of each step in an asbestos abatement project.
- Identify suspect asbestos containing materials not identified in the scope of work during renovation and construction activities, arrange testing of the suspect ACM for asbestos content, and if ACM, ensure its removal by a qualified asbestos abatement contractor if it will be disturbed during the project.
- Ensure that asbestos related work is performed in accordance with all applicable appendices, regulations and OHB guidance.
- Provide a copy of survey results to OHB
- Provide a final report to OHB detailing all ACM removed during abatement and/or repair activities.
- Assure that building occupants and employers are properly notified in advance of, during, and following the completion of asbestos work.
- Provide the results of air samples taken during Class I, II, and III work to employers of employees in contiguous areas and to the OHB within 10 days.
- Post results of air samples taken during Class I, II, and III work at entrance to abatement work site.

Researchers

- Identify the use of ACM on safety permit applications and contact OHB for operations involving ACM not subject to a safety permit.

Managers

- Ensure that COTR's and others in their organization with responsibility for projects involving asbestos abatement activities are accountable for compliance with this policy via performance appraisals and/or other means.
- Notify OHB of operations involving ACM.
- Ensure that employees working with ACM receive the training specified for the engineering, work practice controls, and personal protective equipment specified for their operations.

Employees

- Shall properly use engineering and work practice controls and personal protective equipment specified for their operations.

Training Requirements

Class I and Class II Worker/Supervisors require EPA Asbestos Abatement Worker / Supervisor Training (32 / 40 hours), with annual refresher training (8 hours). The curriculum must include hands on training session applicable to the type of asbestos abatement activities the worker will be performing on the job. If the worker is to abate only one type of Class II material, (example - floor tile) the 32-hour worker training may be waved in favor of an 8-hour course. This training must include a hands on session for the specific abatement activity, which the worker will perform. For each additional type of Class II material, which the worker is expected to abate, individual 8-hour training sessions are required.

Class III Workers require EPA Operations and Maintenance Training or equivalent (16 hours), with 4 hours annual refresher training. A Competent Person (as defined by EPA and OSHA) must review the curriculum and confirm that it properly prepares the workers for their expected duties.

Class IV Workers require 2 hours of awareness training annually.

Asbestos Air Sampling

Clearance and environmental air sampling will be performed by persons with American Board of Industrial Hygiene certification, or persons with an Ohio Department of Health (ODH) certification as an Asbestos Hazard Evaluation Specialist.

REFERENCES

U.S. Department of Labor, Occupational Safety and Health Administration, 29 CFR 1926.1101 and 29 CFR 1910.1001, Asbestos.

U.S. Environmental Protection Agency, 40 CFR 61.140 - 61.157, National Emission Standards for Hazardous Air Pollutants; National Emission Standards for Asbestos.

Ohio Department of Health, chapter 3701-34 Ohio Administrative Code, Asbestos Abatement Hazard Rules.

USEPA, National Emission Standards for Hazardous Air Pollutants; Amendments to Asbestos Standard; Final Rule (49FR13661; April 5, 1984).

USEPA, Toxic Substances; Asbestos Abatement Projects; Final Rule 51FR62044A; April 25, 1986.

RECORDS

OHB maintains the following records:

- Hazard Assessments
- Asbestos Survey Records (FASS Database & Hardcopy)
- Exposure Monitoring Data

EMB maintains the following record:

- Asbestos Blanket Permit Data

Safety and Mission Assurance Directorate (SMAD)
Safety, Health, and Environment Division (SHED)
Occupational Health Branch Chief, Gayle M. Reid
Program Lead: Betty L. Hodgson, SAIC {mailto:Betty.L.Hodgson@nasa.gov}
Curator: Sandra Jacobson, SAIC {mailto:Sandra.Jacobson@nasa.gov}
Last Revision Date: March 2007

Asbestos Program

4/1/07